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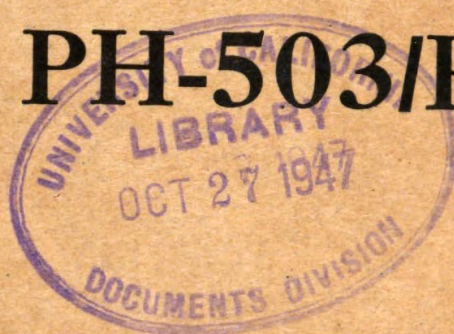
TM 11-2377

WAR DEPARTMENT TECHNICAL MANUAL

U.S. Dept. of Army

*113
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TM
1945*

CAMERA PH-503/PF



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WAR DEPARTMENT

16 APRIL 1945

Original from

UNIVERSITY OF CALIFORNIA

CAMERA PH-503/PF



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WAR DEPARTMENT,
WASHINGTON 25, D. C., 16 April 1945.

TM 11-2377, Camera PH-503/PF, is published for the information and guidance of all concerned.

[A. G. 300.7 (30 March 45).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

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*Major General,
The Adjutant General.*

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(For explanation of symbols see FM 21-6.)

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Paragraph Page

TABLE OF CONTENTS

PART ONE. Introduction.

★ ★

SECTION I. Description of Camera PH-503/PF.		
General	1	1
Weights and dimensions.....	2	1
Description of camera.....	3	1
Lamps	4	3
Batteries	5	3
Shutter	6	3
Lens	7	3
Focusing panel.....	8	4
Film holder	9	4
Carrying handle.....	10	5
II. Installation and assembly.		
Uncrating and unpacking.....	11	5
Installation of battery.....	12	5

PART TWO. Operating instructions.

III. Step-by-step operating procedure.		
Preparation of fingerprint.....	13	6
Choice of film and exposure.....	14	7
Loading film holder.....	15	9
Use of focusing panel.....	16	10
Insertion of film holder in camera.....	17	10
Opening camera.....	18	10

SECTION III. Step-by-step operating procedure (contd).		
Operation of shutter.....	19	10
Operation of lamps.....	20	11
Taking picture, using focusing panel.....	21	11
Taking picture without focusing panel.....	22	12

PART THREE. Preventive maintenance.

IV. Preventive maintenance techniques.		
Meaning of preventive maintenance.....	23	13
General preventive maintenance.....	24	14
Cleaning lens.....	25	14

TABLE OF CONTENTS

	<i>Paragraph</i>	<i>Page</i>
Cleaning film holder.....	26	14
Cleaning camera interior.....	27	14

V. Lubrication.

Lubrication requirements	28	14
--------------------------------	----	----

PART FOUR. Auxiliary equipment.

VI. Auxiliary equipment for Camera PH-503/PF.

Operating aids.....	29	15
---------------------	----	----

PART FIVE. Repair instructions.

VII. Theory of equipment.

Shutter	30	16
Lamps	31	16
Lens	32	16

VIII. Trouble shooting.

Trouble chart.....	33	17
--------------------	----	----

IX. Repair.

Shutter escapement lever spring.....	34	17
Shutter spring	35	19
Short-sheared contact arm and long-sheared contact arm.....	36	19
Lever contact arm	37	21
Rear section small contact arm.....	38	21
Battery magazine rear latch fastener.....	39	21
Battery magazine front latch fastener.....	40	23
Front door latch fastener.....	41	23
Replacement of lamps.....	42	23
Unsatisfactory Equipment Report.....	43	25

APPENDIX.

X. Maintenance parts.

Maintenance parts for Camera PH-503/PF..	44	26
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DESTRUCTION NOTICE

WHY —To prevent the enemy from using or salvaging this equipment for his benefit.

WHEN—When ordered by your commander.

HOW —1. Smash —Use sledges, axes, handaxes, pickaxes, hammers, crowbars, heavy tools.
2. Cut —Use axes, handaxes, machetes.
3. Burn —Use gasoline, kerosene, oil, flame throwers, incendiary grenades.
4. Explosives—Use firearms, grenades, TNT.
5. Disposal —Bury in slit trenches, fox holes, other holes. Throw in streams. Scatter.

USE ANYTHING IMMEDIATELY AVAILABLE FOR DESTRUCTION OF THIS EQUIPMENT.

WHAT—1. Smash—Lens, lamps, camera box, film holder, focusing panel.
2. Cut —Wire and connections.
3. Burn —Film, batteries, this manual.
4. Bend —Front door.
5. Bury or scatter—All that remains.

DESTROY EVERYTHING.



Figure 1. Camera PH-503/PF.

PART ONE

INTRODUCTION

SECTION I

DESCRIPTION OF CAMERA PH-503/PF

1. GENERAL.

Camera PH-503/PF (Graflex Finger Print Camera) (fig. 1) photographs fingerprints, coins, stamps, portions of printed matter, and other small flat objects on a plane surface. The camera reproduces a subject within an area measuring $2\frac{1}{8}$ by $3\frac{1}{8}$ inches on $2\frac{1}{4}$ - by $3\frac{1}{4}$ -inch film. The reproduction is the size of the original. No photographic skill is required to operate the camera. It is a complete, self-contained unit with a fixed-focus lens, battery-operated lamps to illuminate the subject, a focusing panel, and a cut film holder (fig. 3).

2. WEIGHTS AND DIMENSIONS.

Component	Dimensions (in.)			Unit weight (lb)
	Height	Width	Length	
Camera (complete)	6.0	6.50	12.0	5.0
Focusing panel	3.125	0.50	4.375	0.125
Film holder	3.125	0.50	5.0	0.125

3. DESCRIPTION OF CAMERA.

The fingerprint camera is composed of three sections (fig. 6): the cone, the battery magazine, and the rear section. The three sections are hinged together, but may be swung apart to permit access to the interior. The camera is constructed of wood covered with imitation sealgrain. The door, clips, and hinges are brass, finished in black spray.

a. The cone protects the lamps on the front of the battery magazine section, and excludes extraneous light from the subject. It has a rectangular aperture covered by a spring-hinged metal door. The aperture measures $2\frac{3}{8}$ by $3\frac{1}{4}$ inches and approximates the size of the film used by the camera.

b. The battery magazine contains three parallel compartments (fig. 11). The upper and lower compartments house the batteries and connectors which supply current to the lamps. The middle compartment contains, at the extreme

left side, a small wooden drawer (fig. 11 (1)) which holds six extra lamps. Except for the drawer, the middle compartment is hollow. A 1-inch hole (fig. 11 (3)) is drilled through the middle of the partition in the rear of this compartment. This hole allows light to pass to the lens. The lamp socket frame is attached to the front of the battery magazine, and contains a $1\frac{7}{8}$ -by $2\frac{3}{8}$ -inch aperture in its center for the passage of light to the lens.

c. The rear section of the camera (fig. 12) is a wooden box. The shutter and lens assembly is mounted on the wooden panel at the front of this section. The shutter arm plate (fig. 5) is fastened by screws to the right side. Located on this plate are the contact plunger which controls the lights, and the protruding end of the shutter operating arm which operates the shutter and the lights. A scale line, T, is marked on the plate. At the back of the rear section is a $2\frac{3}{8}$ -by $3\frac{1}{4}$ -inch opening. A slide lock (fig. 10) above the opening, and a retaining strip below hold in place the focusing panel or the film holder.



Figure 2. Camera PH-503/PF in use.

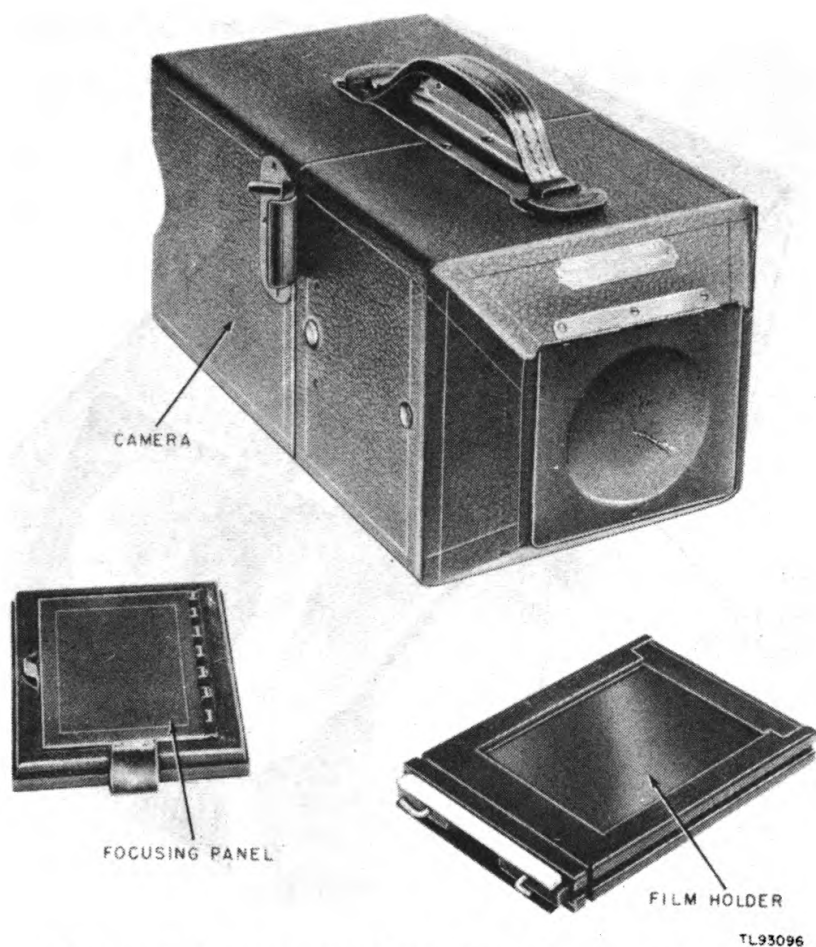


Figure 3. Camera PH-503/PH, complete equipment.

4. LAMPS (fig. 6).

Four 3.8-volt, 0.3-ampere miniature lamps are mounted one on each corner of the lamp socket frame to illuminate the subject. They may be used to locate the subject and are the sole source of illumination during an exposure. The lamps are protected by the cone and are easily accessible for replacement.

5. BATTERIES (fig. 7).

Batteries for this camera are not supplied, but must be requisitioned separately. Those ordinarily used are two Eveready No. 789 batteries, Signal Corps stock No. 3A789. Each battery consists of four cells, connected in series-parallel hookup.

6. SHUTTER (fig. 12).

No preliminary adjustment is required to fix the exposure period.

7. LENS (fig. 12).

The Kodak anastigmat, $f/6.3$ lens is fixed in the camera rear section at a point where it will render a well-defined, full-sized image of the subject when the camera is properly placed.

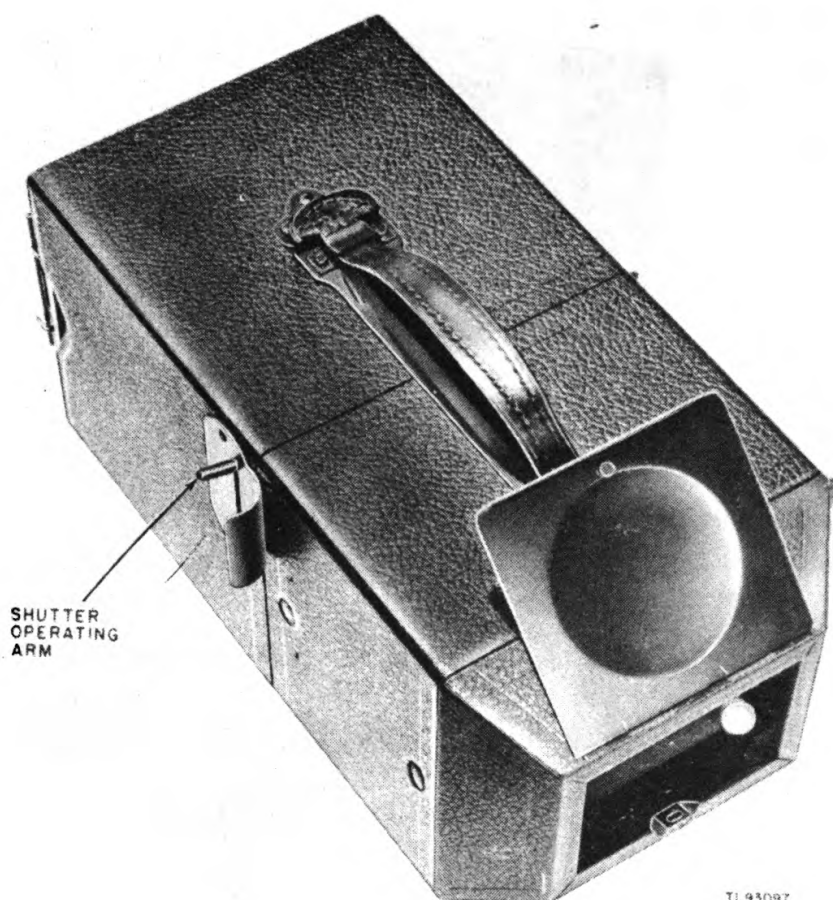


Figure 4. Camera PH-503/PF, front view.

8. FOCUSING PANEL (fig. 10).

The focusing panel consists of a $2\frac{1}{4}$ - by $3\frac{1}{4}$ -inch ground glass, mounted in an oblong wooden frame. A small leather tab is attached to the frame. The cover and back section of the panel are finished in black imitation seal-grain. The smooth front surface is finished in black spray. The panel fits on the back of the rear section, and is held in place by the slide lock and the retaining strip. The spring-hinged cover protects the ground glass when it is not in use. Imitation leather side curtains help to exclude light when the operator is viewing the subject.

9. FILM HOLDER (fig. 5).

The film holder has compartments on two sides to accommodate $2\frac{1}{4}$ - by $3\frac{1}{4}$ -inch cut film. The film holder fits on the back of the camera in the same manner as the focusing panel. Two black fiber safety slides are supplied to protect the film in the holder from light. The metal end of the slide which protrudes from the holder is light on one side and black on the other.

10. CARRYING HANDLE (fig. 6).

The black leather carrying handle is secured to a metal plate which is attached to the top of the battery magazine, and extends over the top of the rear section. Here it fits into the handle retaining plate, but is detached from the plate when the battery magazine is swung open from the rear section.

SECTION II

INSTALLATION AND ASSEMBLY

11. UNCRATING AND UNPACKING.

The camera, focusing panel, and film holder are packed in a fiber cardboard container, which is shipped in a nailed wooden box with steel strapping.

a. Open the wooden box and take out the cardboard container. Remove the lid from the container and lift out the focusing panel, film holder, and camera.

b. Check the condition of the equipment when it is unpacked. If damaged or missing parts appear in the list of maintenance parts (par. 44), new parts may be obtained.

12. INSTALLATION OF BATTERY (fig. 7).

a. Press the rear concealed button on the right side of the battery magazine and swing the battery magazine open from the rear section.

b. Insert one battery in each of the upper and lower compartments of the magazine. Be sure that the metal battery connectors make proper contact with the connectors in the camera.

c. Close the battery magazine.

PART TWO

OPERATING INSTRUCTIONS

NOTE: For information on destroying this equipment to prevent enemy use, see the destruction notice at the front of this manual.

SECTION III

STEP-BY-STEP OPERATING PROCEDURE

13. PREPARATION OF FINGERPRINT.

Preparation of the fingerprint before photographing it is not always necessary. A fingerprint composed of dust, paint, grime, blood, or some coloring matter may present sufficient contrast to its background to photograph well.

a. If the fingerprint is faint, it may be necessary to increase its contrast with the material on which it occurs. Powder adheres to the pattern produced by the oily moisture from the surface ridges of the hands. Dust the fingerprint with powder. Use white powder on dark surfaces, black powder on light surfaces.

NOTE: If the fingerprint is dusted with white powder, the resultant picture will show a white impression on a dark ground, the reverse of the usual black ink impression on a white ground. To show black ridges on a light ground even though light powder is used, the photographer may prepare a positive transparency from the negative, and print from the transparency.

b. Fingerprints on glass are often photographed successfully if a black cloth is placed behind the glass to subdue harsh reflections or back lighting. Dust the fingerprint with white powder.

c. If a fingerprint is on a curved, uneven, or inaccessible surface, it may be impossible to take a satisfactory photograph with Camera PH-503/PF. Lifting tape sometimes may be used to take an impression of the fingerprint. The tape then may be placed on a flat surface and photographed. The tape has a gummed, opaque surface, either black or white.

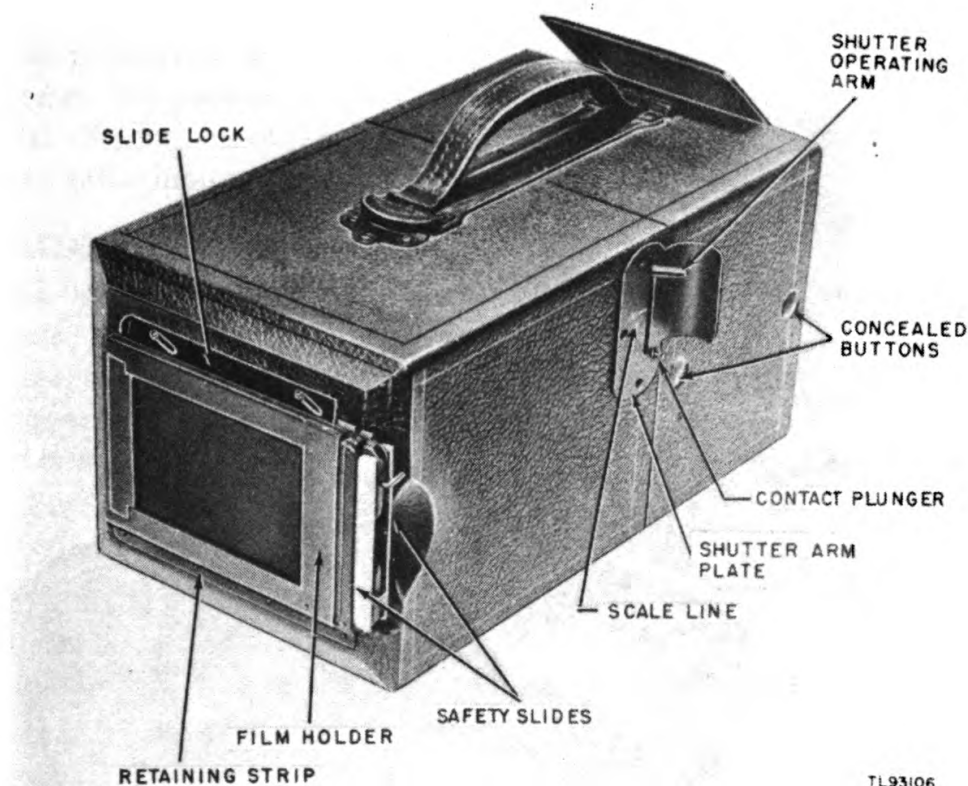
(1) Choose lifting tape of a color contrasting with that of the powder used for dusting the fingerprints.

(2) Place the gummed surface in even and firm contact with the dusted latent impression.

(3) Remove the lifting tape from the surface.

(4) An impression of the fingerprint adheres to the gummed side of the tape. Cover the tape with a piece of acetate sheeting to help preserve it until it can be photographed.

NOTE: Right and left are reversed in an impression taken with tape.



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Figure 5. Camera PH-503/PF, rear view.

14. CHOICE OF FILM AND EXPOSURE.

The completed picture should reproduce clearly the detail of the original. In the case of fingerprints and certain other objects, increased contrast may be desired in the reproduction. Contrast may be increased by use of suitable film, correct period of exposure, and proper development.

a. When fingerprints are located on dark surfaces, such as safes, polished mahogany, or oak, use Par Speed Sheet Film. Expose the film for about 5 seconds.

b. Light surfaces, such as chinaware, paper, silverware, and mirrors are highly reflective. For fingerprints located on this type of surface, use a slower film than that recommended in subparagraph a. above to produce satisfactory contrast. Use Eastman Process Sheet Film, exposing for about 6 seconds.

c. If the films recommended above are not available, any film of good contrast may be substituted. The approximate exposure time for other films can be determined by the relative film speeds. For film speeds see TM 11-2351, Exposure Meters PH-77, PH-77-A, PH-77-C, PH-77-D, PH-77-E and PH-252-A, as changed by Change 1, dated 5 December 1944.

d. When latent fingerprints against multicolored backgrounds are photographed on process film, the interference of the colors usually results in inadequate contrast. If the background consists of only two or three colors, use of contrast process panchromatic film may result in a satisfactory reproduction.

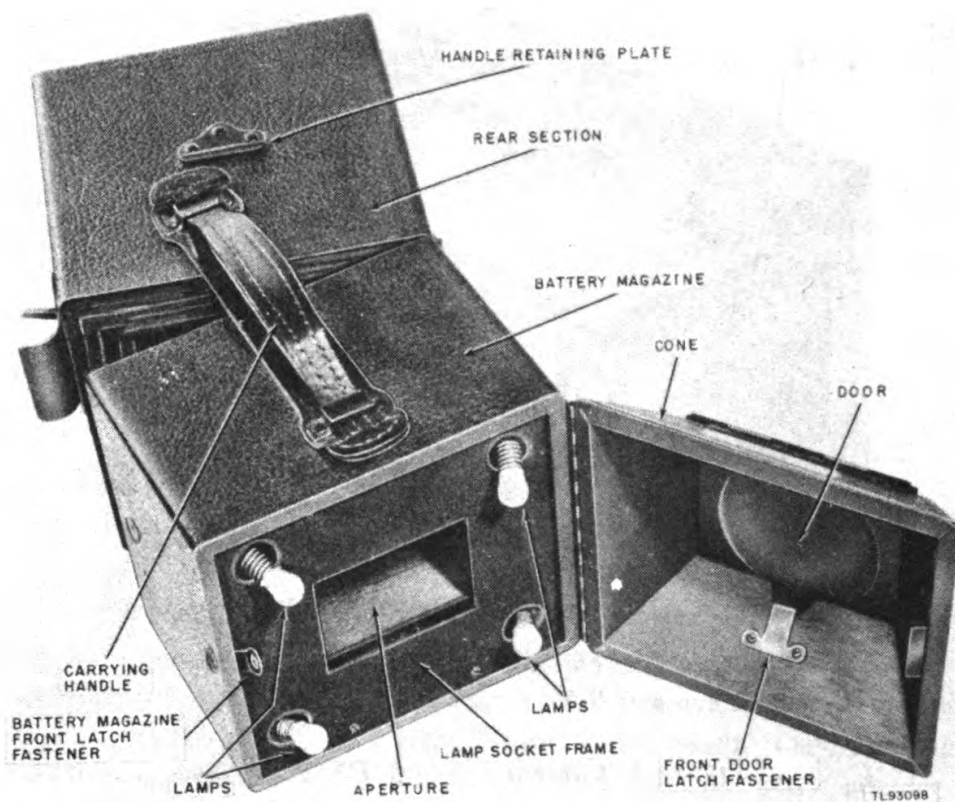


Figure 6. Cone, battery magazine, and rear section.

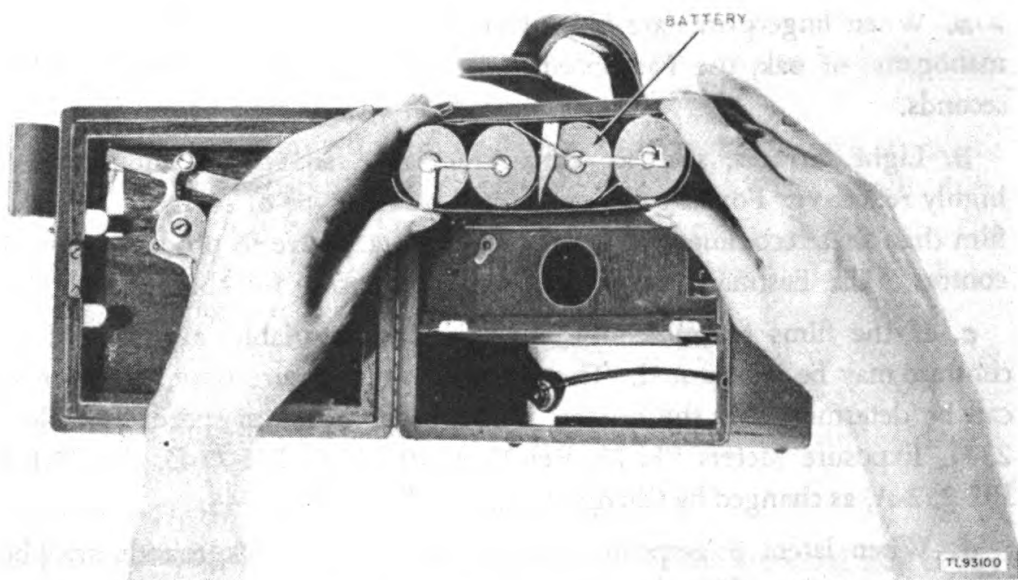


Figure 7. Installing battery.

e. In photographing certain objects, such as coins or prints with three or four tones, the photographer may not wish to increase the contrast of the original. For pictures of this type and for any pictures of colored objects, use ordinary orthochromatic or panchromatic film.

15. LOADING FILM HOLDER (fig. 8).

Load the film holder in a darkroom lighted by a safelight that is safe for the particular film. If a darkroom is not available, a changing bag may be used. Each side of the holder accommodates one sheet of $2\frac{1}{4}$ by $3\frac{1}{4}$ -inch cut film. To acquire skill in loading and unloading the holder, practice in daylight with a used or exposed sheet of film.

- a. Lay the film holder flat on a table or bench.
- b. Slide the safety slide partially out, thus freeing the end through which the film may be inserted.
- c. Lift the free end and insert the film. Insert the film with the emulsion side up. To determine the emulsion side, feel along the edges of the film for a series of small notches. When the notches are on the right-hand side of the top edge, the emulsion side of the film faces the operator. Be sure that the film passes beneath the small flanges that act as retainers.

CAUTION: Touch only the edges of the film.

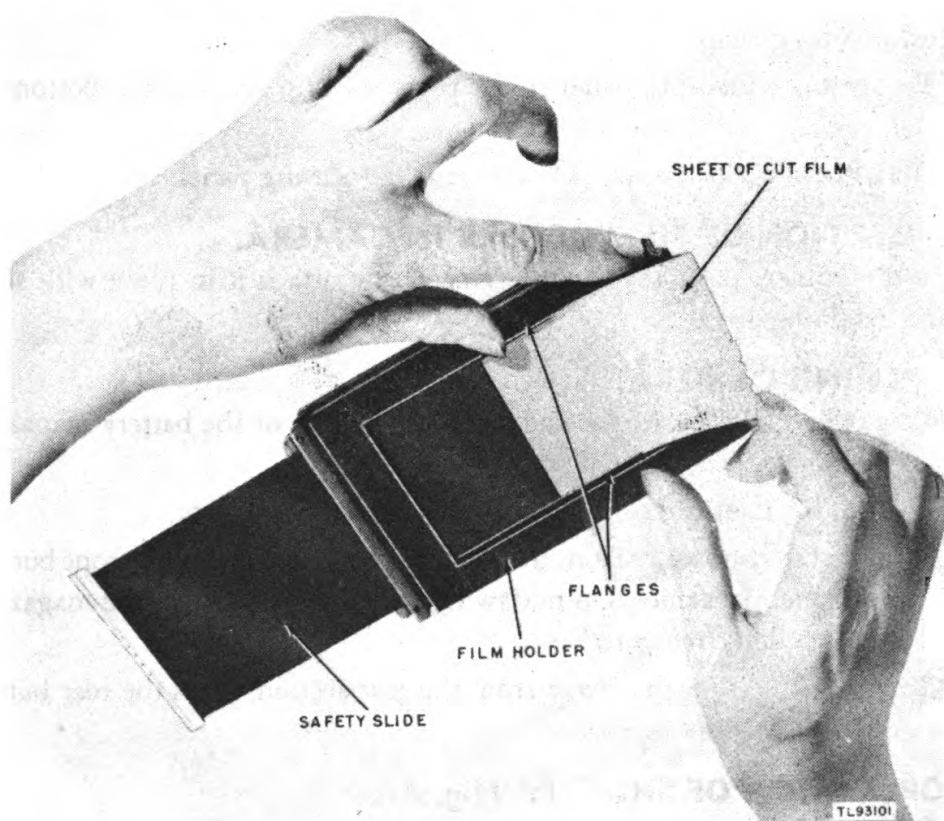


Figure 8. Loading film holder.

- d. Press the raised end of the film holder back into place.
- e. Slide the safety slide back into position and lock it in place by turning one of the little hooks over the top of the slide. The locked position of the hook usually indicates that the holder contains film, whether exposed or unexposed.
- f. Load the other compartment of the film holder according to directions in subparagraphs a through e above.

NOTE: The portion of the safety slide protruding from the holder is light on one side and black on the other. This difference helps the operator to distinguish between exposed and unexposed film. When loading unexposed film, insert the safety slide with the light side out. After the exposure has been made, replace the safety slide with the black side out. Raised dots on the light side of the safety slide help the operator to distinguish this side from the dark side when the film is being loaded. Protect the film with safety slides except during actual exposure. After an exposure, be sure to replace the safety slide in front of the film before removing the holder from the camera.

16. USE OF FOCUSING PANEL (figs. 9 and 10).

Use of the focusing panel is optional. The position of the lens is fixed for correct focus of the subject, when the camera is properly placed. Change of focus is neither possible nor necessary. The focusing panel is used to view the subject and to center it in the field.

- a. Attach the focusing panel to the back of the camera by means of the slide lock and retaining strip.
- b. To open the focusing panel cover, press the clip catch at the bottom of the panel.
- c. Draw the slide lock upward to remove the focusing panel.

17. INSERTION OF FILM HOLDER IN CAMERA.

Place the holder at the rear of the camera, and attach it in place with slide lock and retaining strip.

18. OPENING CAMERA.

Two concealed buttons are located on the right side of the battery magazine (fig. 5) and a third is located below the front door.

- a. To open the door, press the button beneath the front door.
- b. To open the cone away from the battery magazine, press the front button on the side of the magazine. Do not swing the cone open from the magazine except to replace defective parts.
- c. To swing the magazine away from the rear section, press the rear button on the side of the battery magazine.

19. OPERATION OF SHUTTER (fig. 2).

- a. Depress the protruding end of the shutter operating arm as far as the scale line T. This operation lights the lamps and opens the shutter.

b. Hold the end of the shutter operating arm at T for the length of time required for the exposure.

c. Depress the shutter operating arm as far as it will go. This operation closes the shutter. A click of the shutter should be heard.

d. Release the shutter operating arm. The return of the arm to normal position breaks the circuit of the lighting system.

20. OPERATION OF LAMPS.

The lamp system may be operated by slightly depressing the end of the shutter operating arm, or by pushing the contact plunger. Use of the shutter operating arm not only turns on the lamps but also opens the shutter (par. 19a). The contact plunger operates the lamps without opening the shutter. This device enables the operator to use the lamps to locate the print or for some other purpose, without exposing film already loaded in the camera.

21. TAKING PICTURE, USING FOCUSING PANEL.

a. Attach the focusing panel to the camera.

b. Open the front door by pressing the concealed button beneath the door.

c. Place the camera with the cone against the surface to be photographed (figs. 1 and 2).

d. Depress the end of the shutter operating arm to T, opening the shutter and lighting the lamps (fig. 2).

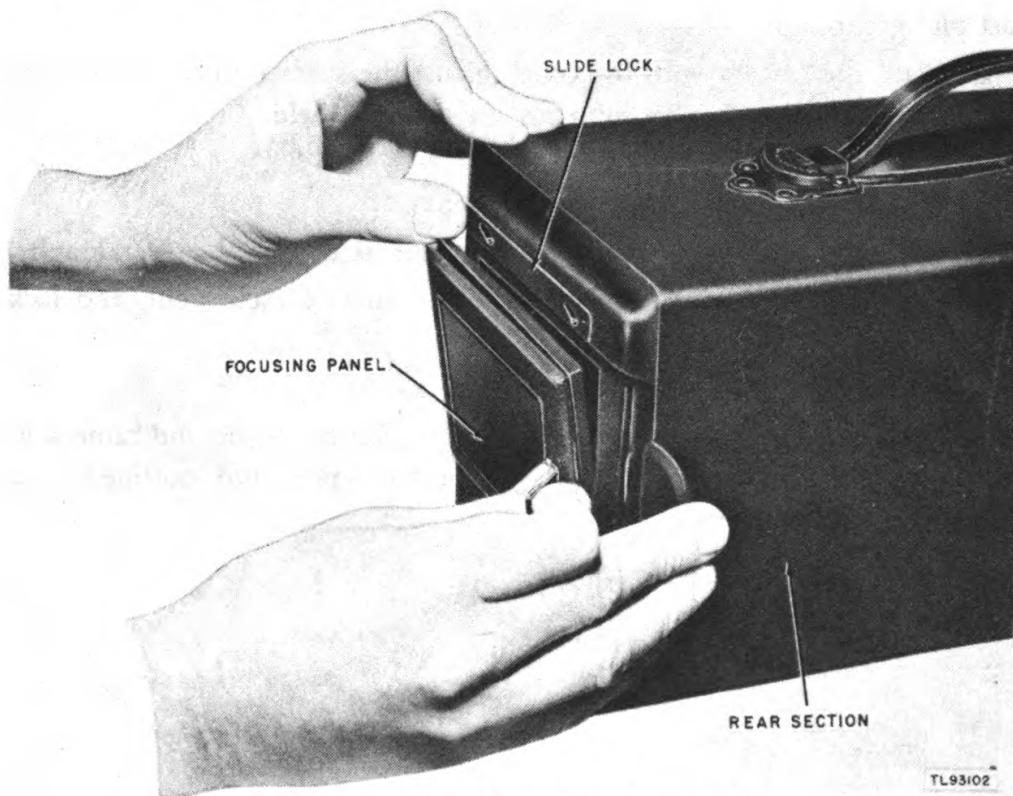


Figure 9. Installing focusing panel.

e. Open the focusing panel cover (fig. 10).

f. View the subject on the ground glass and center it in the field.

NOTE: Do not change the position of the camera until the exposure has been made.

g. Close the shutter by releasing the shutter operating arm. When the arm resumes its normal position, the lamps will be extinguished.

h. Replace the focusing panel with a loaded film holder (fig. 5).

i. Remove the safety slide *nearest* the lens.

j. Expose the film by operating the shutter as described in paragraph 19.

k. Replace the safety slide with the black surface facing out, and turn the hook to the locked position.

l. Remove the film holder from the camera.

m. If a second exposure is desired, replace the holder in the camera with the unexposed film nearest the lens, and repeat the procedure outlined in subparagraphs a through l above. The focusing panel may not be necessary for the second exposure.

22. TAKING PICTURE WITHOUT FOCUSING PANEL.

a. Insert the loaded film holder in the camera.

b. Open the front door by pressing the concealed button beneath the door.

c. If light is needed to locate or examine the fingerprint, depress the contact plunger to light the lamps.

d. Place the camera with the cone against the surface to be photographed (figs. 1 and 2), and with the subject centered in the field.

e. Release the contact plunger, extinguishing the lights.

f. Remove the safety slide nearest the lens.

g. Expose the film by operating the shutter as described in paragraph 19.

h. Replace the safety slide with the black surface facing out, and lock it in position.

i. Remove the film holder from the camera.

j. If a second exposure is desired, replace the holder in the camera with the unexposed film nearest the lens. Repeat the procedure outlined in subparagraphs c through i above.

PART THREE

PREVENTIVE MAINTENANCE

SECTION IV

PREVENTIVE MAINTENANCE TECHNIQUES

23. MEANING OF PREVENTIVE MAINTENANCE.

Preventive maintenance may be defined as a series of operations performed on equipment to minimize interruptions in service and to eliminate major breakdowns. The function of trouble shooting and repair, on the other hand, is to locate and correct existing defects. This section of the manual contains specific instructions and serves as a guide for personnel assigned to perform the basic maintenance operations.

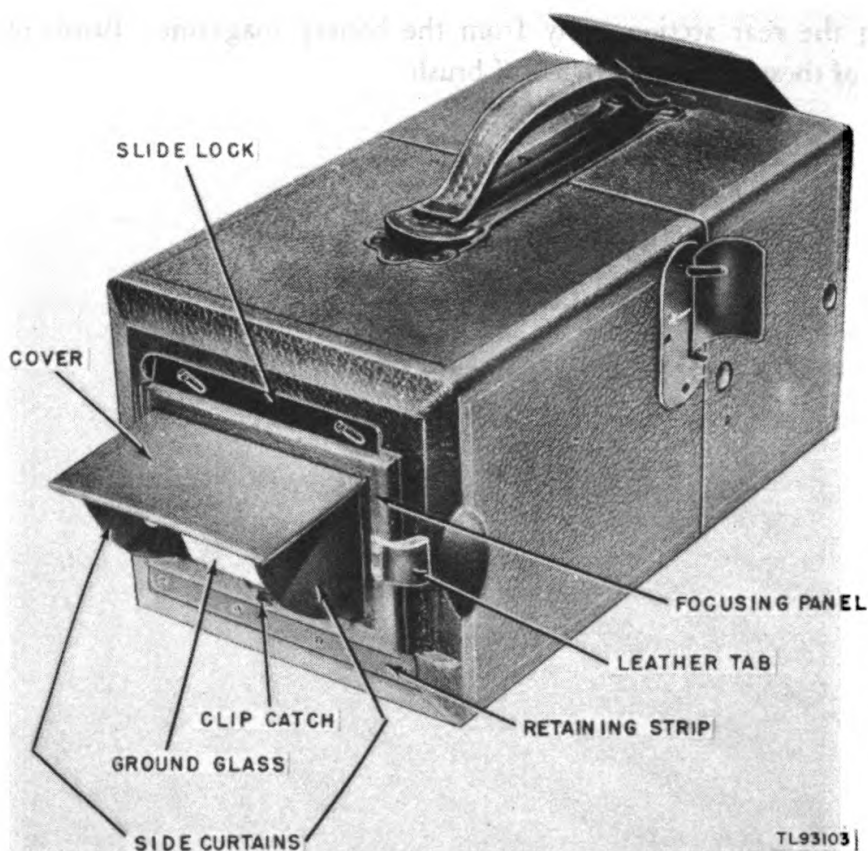


Figure 10. Focusing panel open.

24. GENERAL PREVENTIVE MAINTENANCE.

Cleaning is the only preventive maintenance required by the fingerprint camera. The lens, in particular, must be kept free of dirt. See paragraph 12 for instructions for replacement of worn batteries.

25. CLEANING LENS (fig. 12).

CAUTION: Never touch the lens elements with the fingers. Do not use water, polishing material, alcohol, or other solvent on the lens. Never unscrew the lens elements from the mount. Clean only when necessary.

Remove dust or lint from the polished surfaces with a soft camel's hair brush. Clean the surfaces with a white cloth or lens tissue. Under normal conditions, it will not be necessary to clean the inside surfaces.

26. CLEANING FILM HOLDER.

Dust the film holder thoroughly inside and out before loading it. Use a reasonably stiff brush with bristles that will not shed. Dust the slides thoroughly on both sides.

27. CLEANING CAMERA INTERIOR.

Press the rear concealed button on the side of the battery magazine (fig. 5) to swing the rear section away from the battery magazine. Brush out the interiors of these sections with a stiff brush.

SECTION V

LUBRICATION

28. LUBRICATION REQUIREMENTS.

No lubrication is required for Camera PH-503/PF.

PART FOUR

AUXILIARY EQUIPMENT

SECTION VI

AUXILIARY EQUIPMENT FOR CAMERA PH-503/PF

29. OPERATING AIDS.

- a.** Changing Bag PH-105 may be used for loading the film holder supplied with Camera PH-503/PF, when a darkroom is not available.
- b.** Pictures may be taken on this camera with film pack, if a film pack adapter is available. The adapter is attached to the rear of the camera in place of the film holder.
- c.** A cut film magazine may be used in place of the film holder supplied with the camera.

PART FIVE

REPAIR INSTRUCTIONS

NOTE: Failure or unsatisfactory performance of equipment used by Army Ground Forces and Army Service Forces will be reported on W.D., A.G.O. Form No. 468 (Unsatisfactory Equipment Report); by Army Air Forces, on Army Air Forces Form No. 54 (unsatisfactory report). If either form is not available, prepare the data according to the sample form reproduced in figure 14.

SECTION VII

THEORY OF EQUIPMENT

30. SHUTTER (fig. 12).

Downward pressure on the shutter operating arm opens and closes the figure eight-shaped shutter plate. The shutter escapement lever (6) is attached to the shutter operating arm (5) and is moved down by the arm. The lever engages and depresses a stud attached to the rear of the shutter plate (9). When the stud is forced down, it causes the shutter to pivot upward and reveal the lens. When the shutter operating arm has been pressed down as far as it will go, the shutter escapement lever slips off the stud at the rear of the shutter plate. Release of the stud allows the shutter to spring back to its normal position covering the lens.

31. LAMPS.

a. Operation with Shutter. Slight downward pressure on the shutter operating arm closes the electrical circuit between the shutter operating arm and the lever contact arm (fig. 12 (4)) inside the camera rear section. When the shutter operating arm is released, it moves away from the lever contact arm, breaking the circuit.

b. Operation without Shutter. Depression of the contact plunger (fig. 5) closes the electrical circuit between the plunger and the lever contact arm (fig. 12 (4)) inside the camera. The electrical current passes through the lever contact arm, the contact plunger, the shutter arm plate (fig. 5), the shutter operating arm (fig. 12 (5)), the shutter operating arm anchor plate (fig. 12 (10)), and the wire leading to the rear section small contact arm (fig. 12 (1)). Release of the contact plunger breaks the circuit.

c. Electrical Circuit. Figure 13, a wiring diagram, illustrates the electrical circuit of Camera PH-503/PF.

32. LENS.

The Kodak anastigmat, $f/6.3$ lens is fixed in position so that the distance from the focal plane to the lens is equal to the distance from the lens to the subject. The reproduction is, therefore, the same size as the subject.

SECTION VIII

TROUBLE SHOOTING

33. TROUBLE CHART.

Trouble	Probable Cause	Remedy
Blurred negatives.	Camera movement. Camera not held flush to surface.	Hold camera steady. Hold camera flush.
Thin negatives.	Subject underexposed. Insufficient illumination.	Increase time of exposure. Make sure that all lamps are lighting.
Failure of lamps to light.	Batteries worn out. Broken connection. Connections not making proper contact.	Replace batteries (par. 12). Check and repair connections. Check all contact points.
Blank negatives.	Safety slide not removed. Failure of shutter to open because shutter escapement lever spring is broken. Failure of shutter to open because shutter plate assembly is revolving around lens mount.	Remove safety slide. Replace shutter escapement lever spring (par. 34). Tighten two setscrews holding shutter plate assembly in place.
Dense negatives.	Film overexposed. Failure of shutter to close because shutter spring is broken.	Decrease time of exposure. Replace shutter spring (par. 35).

34. SHUTTER ESCAPEMENT LEVER SPRING (fig. 12).

a. Removal.

(1) Press the rear concealed button and swing open the rear section, exposing the shutter mechanism.

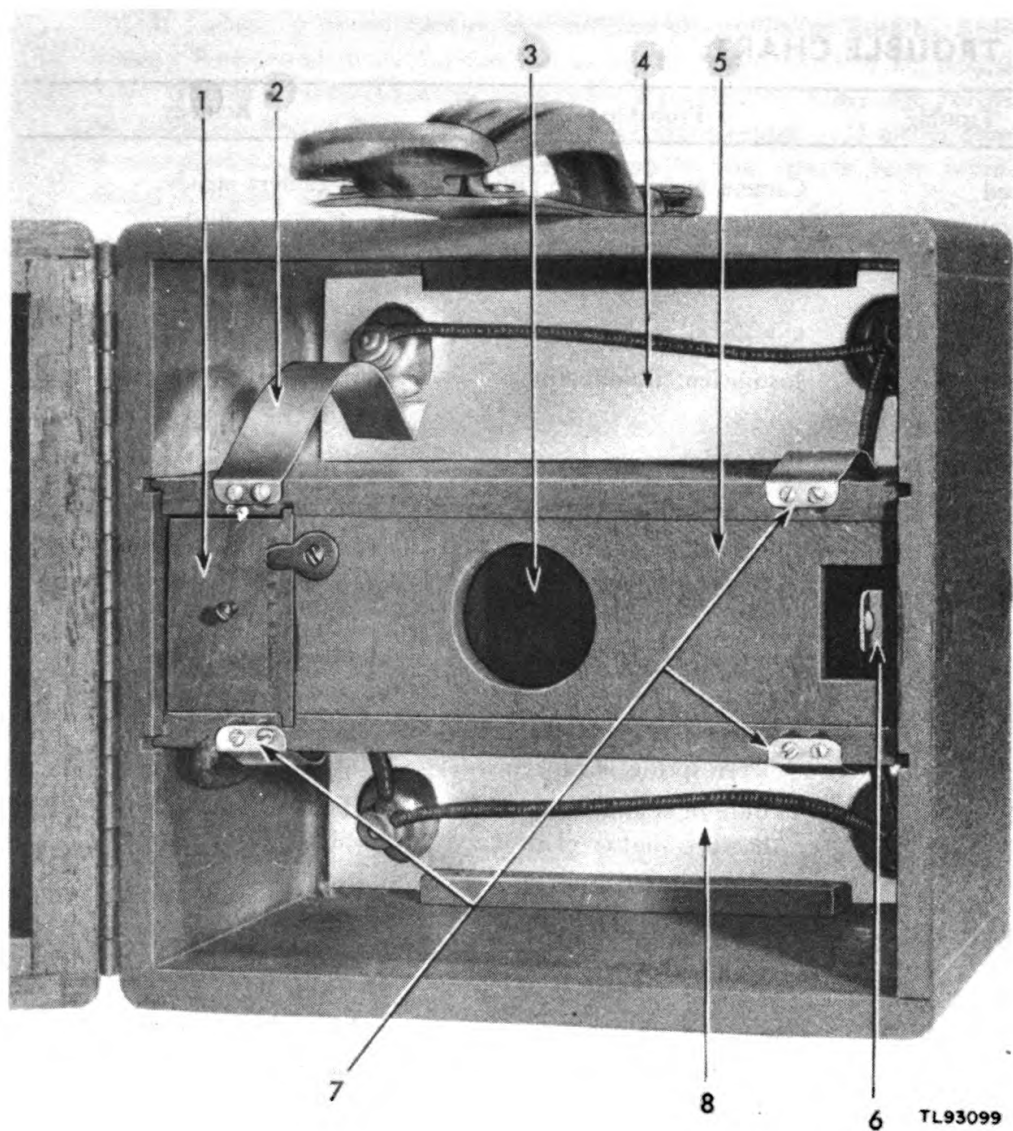
(2) Unscrew and remove the shutter escapement lever screw (8).

(3) Disconnect the short end of the shutter escapement lever spring (7).

(4) Remove both the shutter escapement lever (6) and the shutter escapement lever spring.

b. Replacement.

(1) Hold the shutter escapement lever spring with the long end toward the back of the camera.



- 1. Lamp drawer
- 2. Long-sheared contact arm
- 3. Light hole
- 4. Upper compartment

- 5. Middle compartment
- 6. Battery magazine rear latch fastener
- 7. Short-sheared contact arms
- 8. Lower compartment

Figure 11. Battery magazine.

(2) Connect the short end of the spring to the indent on the shutter escapement lever between the hole and the arm of the lever.

(3) Hook the long end of the spring back of the upright flange on the shutter operating arm. Be sure that the arm of the shutter escapement lever rests above the upright flange on the shutter operating arm.

(4) Replace and tighten the shutter escapement lever screw.

35. SHUTTER SPRING.

a. Removal (fig. 12). The shutter plate assembly is removed in the operation outlined below. Note the position of the assembly before removing it so that it may be replaced in this position. Make a mark on the wood panel below the shutter plate assembly to correspond with the position of the short stud on the shutter wing. This mark may be used as a guide when reinstalling the shutter plate assembly.

(1) Loosen the two setscrews holding the shutter plate assembly to the lens mount.

(2) Remove the shutter plate assembly.

(3) Unhook the shutter spring from the short stud on the shutter plate (9) and the short stud on the shutter wing (2).

b. Replacement.

(1) Hook one end of the shutter spring to the short stud on the shutter plate, and the other end to the short stud on the shutter wing.

(2) Replace the shutter plate assembly with the shutter wing flush with the top of the lens mount, so that the shutter swings freely in and out of position.

(3) Replace and tighten securely the setscrews holding the shutter plate assembly to the lens mount.

36. SHORT-SHEARED CONTACT ARM AND LONG-SHEARED CONTACT ARM (fig. 11).

The long-sheared contact arm (2) is located at the left of the upper battery compartment. The short-sheared contact arms (7) are located at the right of the upper battery compartment, and at the left and right of the lower battery compartment.

a. Removal.

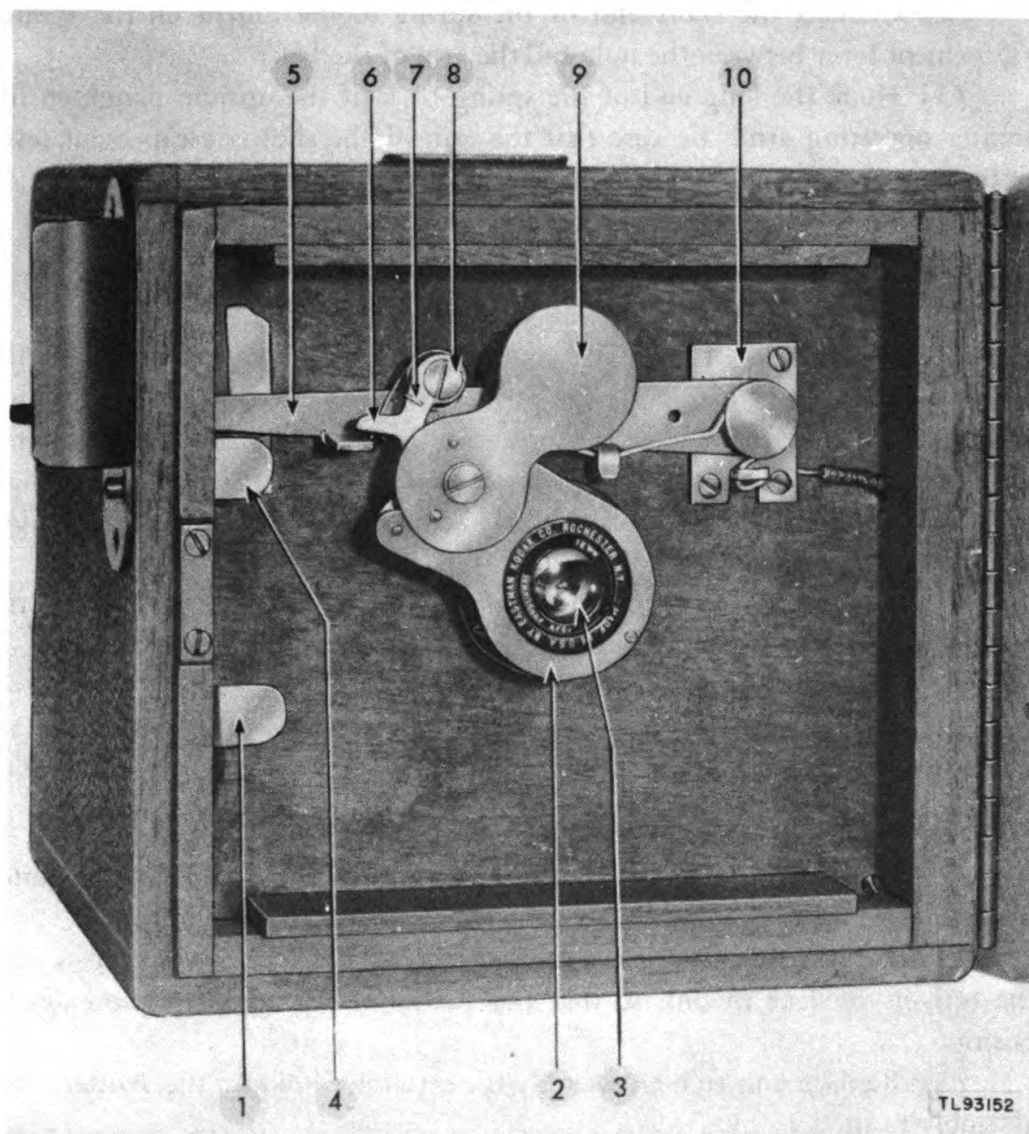
(1) Press the rear concealed button and open the camera.

(2) Remove the upper and lower batteries.

(3) Unscrew and remove the two small brass screws holding the end of the short-sheared or the long-sheared contact arm to the middle compartment.

(4) Remove the arm.

b. Replacement. Reverse the procedure outlined in subparagraph a above.



- | | |
|-----------------------------------|--|
| 1. Rear section small contact arm | 6. Shutter escapement lever |
| 2. Shutter wing | 7. Shutter escapement lever spring |
| 3. Lens | 8. Shutter escapement lever screw |
| 4. Lever contact arm | 9. Shutter |
| 5. Shutter operating arm | 10. Shutter operating arm anchor plate |

Figure 12. Rear section.

37. LEVER CONTACT ARM (fig. 12).

The lever contact arm is in the upper left-hand corner of the rear section (4).

- a. Press the rear concealed button and open the camera.
- b. Remove the lever contact arm by unscrewing the two screws holding the arm in place.
- c. Replace the lever contact arm and secure it with the two screws.

38. REAR SECTION SMALL CONTACT ARM (fig. 12).

The rear section small contact arm (1) is to the left of the lens, as the operator faces the lens, and approximately on a line with the bottom of the shutter plate assembly.

- a. Press the rear concealed button and open the camera.
- b. Remove the rear section small contact arm by unscrewing the two screws holding the arm in place.
- c. Replace the rear section small contact arm and tighten the screws holding it in position. Be sure that the exposed end of the insulated wire, which makes contact with the arm between the screws, is held securely in place.

39. BATTERY MAGAZINE REAR LATCH FASTENER (fig. 11).

a. Removal. The middle compartment of the battery magazine must be removed to permit removal of the battery magazine rear latch fastener (6). This compartment is held in place by four screws entering from the outside of the battery magazine section.

- (1) Press the rear concealed button and open the camera.
- (2) Remove the batteries from the upper and lower compartments (4) and (8).
- (3) Remove the two screws flanking the rear concealed button of the battery magazine.
- (4) Remove the two screws in a similar position on the opposite side of the battery magazine.
- (5) Free the wire under the lamp drawer (1) by removing the two screws holding the short-sheared contact arm and insulated wire.
- (6) Withdraw the middle compartment assembly (5) of the battery magazine.
- (7) Remove the two screws that hold the battery magazine rear latch fastener to the inside of the magazine.

b. Replacement.

- (1) Place the battery magazine rear latch fastener in position within the battery magazine.
- (2) Replace and tighten the two screws holding the battery magazine rear latch fastener to the inside of the battery magazine.

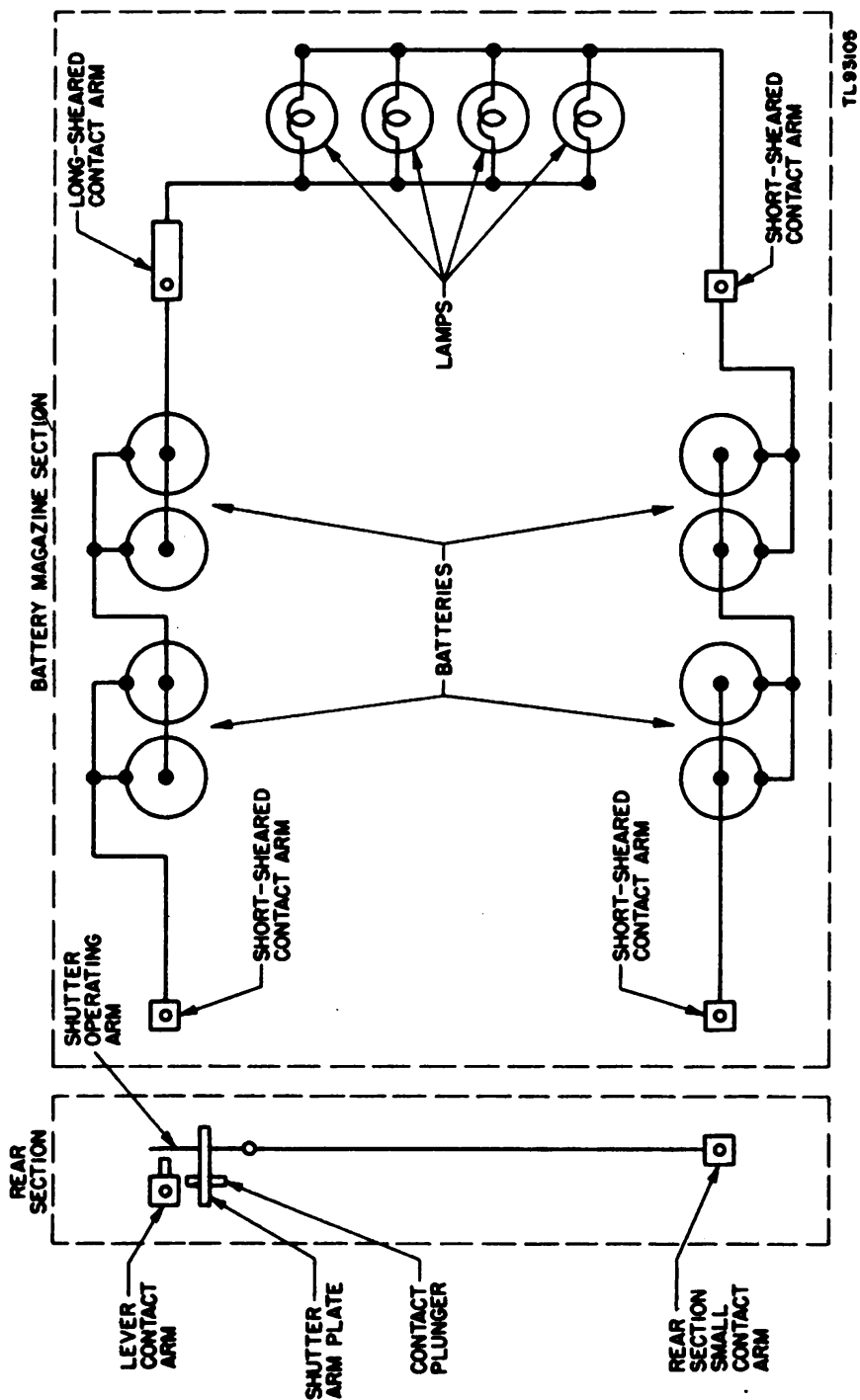


Figure 13. Camera PH-503/PF, wiring diagram.

- (3) Replace the middle compartment assembly in the battery magazine.
- (4) Replace and tighten the four screws holding the middle compartment in place.
- (5) Place the short-sheared contact arm in the lower compartment beneath the lamp drawer.
- (6) Insert the screws attaching the end of the short-sheared contact arm to the middle compartment.
- (7) Place the uncovered portion of the insulated wire beneath the short-sheared contact arm.
- (8) Tighten the screws holding the short-sheared contact arm.
- (9) Replace the batteries.

40. BATTERY MAGAZINE FRONT LATCH FASTENER (fig. 6).

a. Removal.

- (1) Press the front button on the side of the battery magazine to swing the cone away from the magazine.
- (2) Unscrew the four screws holding the lamp socket frame to the front of the battery magazine.
- (3) Remove the lamp socket frame.
- (4) Unscrew the two screws that hold the battery magazine front latch fastener to the inside of the magazine.
- (5) Remove the battery magazine front latch fastener.

b. Replacement. Reverse the procedure outlined in subparagraph a above.

41. FRONT DOOR LATCH FASTENER (fig. 6).

a. Removal.

- (1) Press the front concealed button on the side of the battery magazine to swing the cone away from the magazine.
- (2) Unscrew and remove the two screws holding the front latch fastener to the inside of the cone.
- (3) Remove the front door latch fastener.

b. Replacement.

- (1) Replace the front door latch fastener with the angled end protruding through the radial indent of the aperture.
- (2) Replace and tighten the two screws holding the front door latch fastener to the inside of the cone.

42. REPLACEMENT OF LAMPS.

Spare lamps are carried in the lamp drawer in the middle compartment of the battery magazine (fig. 11 (1)). To replace defective lamps, open the cone away from the battery magazine by pressing the front button on the side of the magazine. This operation exposes the lamp socket frame (fig. 6).

WAR DEPARTMENT UNSATISFACTORY EQUIPMENT REPORT					
FOR	TECHNICAL SERVICE <i>Signal Corps</i>	MATERIEL	DATE <i>6 Feb '45</i>		
FROM	ORGANIZATION <i>165 Signal Photographic Company</i>			STATION <i>APC 432 7a PM, N.Y., N.Y.</i>	
TO	NEXT SUPERIOR HEADQUARTERS <i>Through Platte Signal Officer (Channel)</i>	STATION	TECHNICAL SERVICE <i>Signal Corps</i>		
COMPLETE MAJOR ITEM					
NOMENCLATURE <i>Camera PH-503/PF</i>		TYPE <i>Fingerprint</i>		MODEL	
MANUFACTURER <i>Folmer Graflex Corp.</i>		U. S. A. REG. NO. <i>12604-Phila-45-62</i>	SERIAL NO.	DATE RECEIVED <i>28 Nov '44</i>	
EQUIPMENT WITH WHICH USED (If applicable) <i>Not applicable</i>					
DEFECTIVE COMPONENT—DESCRIPTION AND CAUSE OF TROUBLE					
PART NO. <i>8PB-5380</i>	TYPE <i>Shutter spring</i>	MANUFACTURER <i>Folmer Graflex Corp.</i>		DATE INSTALLED <i>1 Dec '44</i>	
DESCRIPTION OF FAILURE AND PROBABLE CAUSE (If additional space is required, use back of form) <i>Spring broke during exposure, probably because of defective material.</i>					
DATE OF INITIAL TROUBLE <i>3 Feb '45</i>		TOTAL TIME INSTALLED		TOTAL PERIOD OF OPERATION BEFORE FAILURE	
		YEARS	MONTHS	DAYS	HOURS
		<i>—</i>	<i>2</i>	<i>2</i>	<i>118</i>
BRIEF DESCRIPTION OF UNUSUAL SERVICE CONDITIONS AND ANY REMEDIAL ACTION TAKEN <i>Spring replaced with new part. Normal service conditions.</i>					
TRAINING OR SKILL OF USING PERSONNEL		RECOMMENDATIONS (If additional space is required, use back of form)			
POOR	FAIR	GOOD			
		<i>✓</i>			
ORIGINATING OFFICER					
TYPED NAME, GRADE, AND ORGANIZATION <i>JOHN. J. DOE, CAPT, SIG.C. 165th SIG. PHOTO CO</i>				SIGNATURE <i>John J. Doe</i>	
FIRST ENDORSEMENT					
TO CHIEF	TECHNICAL SERVICE <i>Signal Officer, Washington 25, D.C.</i>			OFFICE	
NAME, GRADE, AND STATION			STATION	DATE	
Instructions					
<ol style="list-style-type: none"> 1. It is imperative that the chief of technical service concerned be advised at the earliest practical moment of any constructional, design, or operational defect in material. This form is designed to facilitate such reports and to provide a uniform method of submitting the required data. 2. This form will be used for reporting manufacturing, design, or operational defects in material, petroleum fuels, lubricants, and preserving materials with a view to improving and correcting such defects, and for use in recommending modifications of material. 3. This form will not be used for reporting failures, isolated material defects or malfunctions of material resulting from fair-wear-and-tear or accidental damage nor for the replacement, repair or the issue of parts and equipment. It does not replace currently authorized operational or performance records. 4. Reports of malfunctions and accidents involving ammunition will continue to be submitted as directed in the manner described in AR 730-10 (change No. 3). 5. It will not be practicable or desirable in all cases to fill all blank spaces of the report. However, the report should be as complete as possible in order to expedite necessary corrective action. Additional pertinent information not provided for in the blank spaces should be submitted as footnotes to the form. Photographs, sketches, or other illustrative material are highly desirable. 6. When cases arise where it is necessary to communicate with a chief of service in order to ensure safety to personnel, more expeditious means of communication are authorized. This form should be used to confirm reports made by more expeditious means. 7. This form will be made out in triplicate by using or service organization. Two copies will be forwarded direct to the technical service; one copy will be forwarded through command channels. 8. Necessity for using this form will be determined by the using or service troops. 					

TL93107

Figure 14. Facsimile of Unsatisfactory Equipment Report.

43. UNSATISFACTORY EQUIPMENT REPORT.

a. When trouble in equipment used by Army Ground Forces or Army Service Forces occurs more often than repair personnel feel is normal, War Department Unsatisfactory Equipment Report, W.D., A.G.O. Form No. 468 should be filled out and forwarded through channels to the Office of the Chief Signal Officer, Washington 25, D. C.

b. When trouble in equipment used by Army Air Forces occurs more often than repair personnel feel is normal, Army Air Forces Form No. 54 should be filled out and forwarded through channels.

c. If either form is not available, Form No. 468 (fig. 14) may be reproduced, filled out, and forwarded through channels. When Army Air Forces Form No. 54 is required but unavailable, reproduce Form No. 468 and forward it through channels in accordance with directions on Form No. 468.

APPENDIX

SECTION X

MAINTENANCE PARTS

44. MAINTENANCE PARTS FOR CAMERA PH-503/PF.

The following information was compiled on 27 March 1945. The appropriate sections of the ASF Signal Supply Catalog for Camera PH-503/PF are:

Organizational Spare Parts

SIG 7-PH-503/PF

Higher Echelon Spare Parts

SIG 8-PH-503/PF

For the index of available catalog sections, see the latest section of ASF Signal Supply Catalog SIG 2.

Ref symbol	Signal Corps stock No.	Name of part	Ref symbol	Signal Corps stock No.	Name of part
Fig. 11 (7)	8P8-5365	ARM, contact, short-sheared	Fig. 6	8P8-5352	FASTENER, latch, battery magazine front
Fig. 11 (2)	8P8-5364	ARM, contact, long-sheared	Fig. 12 (7)	8P8-5381	SPRING, shutter escape-ment lever
Fig. 12 (1)	8P8-5348	ARM, contact, rear section small	Fig. 7	8P8-5380	SPRING, shutter
Fig. 12 (4)	8P8-5347	ARM, contact, lever	Fig. 6	3A789	BATTERY, 6-volt
Fig. 6	8P8-5357	FASTENER, latch, front door		2Z5890-12	LAMP
Fig. 11 (6)	8P8-5351	FASTENER, latch, battery magazine rear		6L8100-2	SCREW, wood
				6L8101-2	SCREW, wood
				6L8201-2	SCREW, wood

